

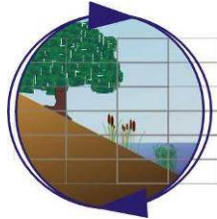
**GEOPHYSICAL SURVEY OFFSHORE OF CARLSBAD, CA
FIELD OPERATIONS AND COMPLIANCE REPORT
GEOPHYSICAL SURVEY PERMIT PRC 9376**

Prepared for:

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February 2017

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**GEOPHYSICAL SURVEY OFFSHORE OF CARLSBAD, CA
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*Merkel and Associates, Inc.
February 2017*

1.0 SURVEY INFORMATION

1.1. Description of Work Performed

M&A performed sidescan sonar surveys of approximately 1,000 acres of shallow nearshore waters at a Carlsbad study site (offshore of Agua Hedionda Lagoon) located approximately 5 nautical miles southeast of Oceanside Harbor. The purpose of the surveys was to document nearshore hard and soft bottom habitats from -50 feet MLLW to the surf zone at sites along the shore. The surveys are part of an on-going annual monitoring program to examine habitat changes through time.

1.2. Weather and Sea State During Operations

Date	Time	Conditions (start-end)	Site and Survey Activity
11-07-16	08:00-15:30	Weather: 100-40%cc Wind: 1-2 BS West, Southwest Temperature: 55-70°F Swell Height (M): 2.5-2.5 Northwest Sea State: 1-2 BS	Carlsbad Nearshore Sidescan Sonar
11-08-16	07:00-17:00	Weather: 20-10%cc Wind: 0-2 BS West, Southwest Temperature: 66-79°F Swell Height (M): 1.5-1.5 Northwest Sea State: 0-2 BS	Carlsbad Nearshore Sidescan Sonar
11-09-16	07:00-14:00	Weather: 100-100%cc Fog Wind: 0-4 BS East Temperature: 62-94°F Swell Height (M): 1.5-2.5 Northwest Sea State: 0-4 BS	Carlsbad Nearshore Sidescan Sonar

cc=cloud cover; BS=Beaufort scale; F = Fahrenheit, (M)) Meters

1.3. Charts, Maps, or Plots Indicating the Areas in Which Exploration was conducted



1.4. Spatial Information Related to Survey Track Lines

Boundary Coordinates of Survey Area	
Latitude (Decimal Degree)	Longitude (Decimal Degree)
33.157132	-117.365303
33.159714	-117.357211
33.120046	-117.329072
33.117046	-117.335847

1.5. Dates and Time of Data Collection

Date	Time	Survey Crew	Site and Survey Activity
11-07-16	08:00-15:30	Jordan Volker, Cory Hom-Weaver, Marine Mammal Observer	Carlsbad Nearshore Sidescan Sonar
11-08-16	07:00-17:00	Jordan Volker, Cory Hom-Weaver, Marine Mammal Observer	Carlsbad Nearshore Sidescan Sonar
11-09-16	07:00-14:00	Jordan Volker, Cory Hom-Weaver, Marine Mammal Observer	Carlsbad Nearshore Sidescan Sonar

1.6. Nature and Location of Any Environmental Hazards Encountered

No environmental hazards were encountered during survey operations.

1.7. Description of Any Accident, Injury, Damage To, Or Loss Of Property

No accidents, injuries, or property damage/loss occurred during survey operations.

1.8. Other Relative Information

There is no other relative information regarding the survey operations to report.

2.0 BIOLOGICAL INFORMATION**2.1. Narrative Description of Encounters with Marine Mammals, Reptiles, and/or Unusual Concentrations of Diving Birds/Seabirds**

Please refer to the Marine Mammal Monitoring Field Observation Report for the survey provided as Appendix A to this report.

2.2. Number of Times Shutdowns or Slow-downs were Ordered

No shutdowns or slow-downs were required during survey operations.

2.3. Summary of Observations of Pinniped Behaviors at Haul-Out Sites

There were no haul-out sites within the survey area.

2.4. Collisions Events

There were no collision events during survey operations.

2.5. Exhibit H

A completed copy of Exhibit H taken from Merkel & Associates Permit PRC 9376 is included as Appendix B to this report.

2.6. Marine Mammal Narrative Summary

Please refer to the Marine Mammal Monitoring Field Observation Report for the survey included as Appendix A to this report.

**APPENDIX A. CARLSBAD NEARSHORE HABITAT MAPPING
MARINE MAMMAL MONITORING FIELD OBSERVATION REPORT**

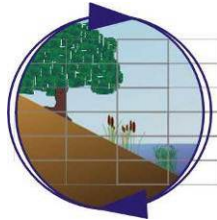
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November 2016

**Carlsbad Nearshore Habitat Mapping
Marine Mammal Monitoring Field Observation Report
(Conducted under Geophysical Survey Permit PRC-9376)**

November 2016

This Field Observation Report has been provided by Merkel & Associates, Inc. (M&A), for marine habitat surveys and mapping shoreline and nearshore waters off of Carlsbad, California, to demonstrate compliance with the requirements of M&A's Geophysical Survey Permit PRC-9376 issued by the California State Lands Commission on October 13, 2016.

M&A performed sidescan sonar surveys of approximately 1,000 acres of shallow nearshore waters at the Carlsbad study site (offshore of Agua Hedionda Lagoon) located approximately 5 nautical miles southeast of Oceanside Harbor (Figure 1).

All sidescan sonar field data were collected with a hull mounted interferometric sidescan sonar operating at 468 kHz. The sonar was set to scan out to 31 meters (m) on both the starboard and port channels for a 62-m wide swath to provide full coverage of the nadir gaps for prior swaths. Parallel survey tracklines were navigated at each project site and reference survey areas until the survey area was covered. The Carlsbad site tracklines extend from intertidal depths to approximately -50 feet MLLW (8.3 fathoms) along the westerly most boundary of the study area (Figure 1).

As required by M&A's Permit PRC-9376, M&A biologist and marine mammal observer, Cory Hom-Weaver, was aboard the survey vessel during all sidescan sonar surveys to document, describe, and report any encounters with marine mammals and/or marine reptiles during the surveys. Ms. Hom-Weaver monitored the project activities during the daylight hours (0700-1700 hours) on November 7, 8 and 9, 2016 as outlined within Table 1.

On-site survey monitoring activities were recorded on field forms and (as appropriate) through photo-documentation. Any sightings of marine mammals were brought to the attention of the boat Captain. If necessary, remedial actions were recommended and subsequently monitored for effectiveness. Marine mammal sightings and any remedial actions recommended and/or undertaken are summarized in Table 2, and field observation notes are included as Attachment A.



Figure 1. Tracklines for interferometric sidescan sonar survey (7-9 November 2016).

Table 1. Summary of Monitoring Dates, Times, Conditions, Monitors, Site and Survey Activity

Date	Time	Purpose	Conditions (start-end)	Monitor	Site and Survey Activity
11-07-16	08:00-15:30	Marine Mammal and Reptile Monitoring	Weather: 100-40%cc Wind: 1-2 BS West, Southwest Temperature: 55-70°F Swell Height (M): 2.5-2.5 Northwest Sea State: 1-2 BS	Cory Hom-Weaver	Carlsbad Nearshore Sidescan Sonar
11-08-16	07:00-17:00	Marine Mammal and Reptile Monitoring	Weather: 20-10%cc Wind: 0-2 BS West, Southwest Temperature: 66-79°F Swell Height (M): 1.5-1.5 Northwest Sea State: 0-2 BS	Cory Hom-Weaver	Carlsbad Nearshore Sidescan Sonar
11-09-16	07:00-14:00	Marine Mammal and Reptile Monitoring	Weather: 100-100%cc Fog Wind: 0-4 BS East Temperature: 62-94°F Swell Height (M): 1.5-2.5 Northwest Sea State: 0-4 BS	Cory Hom-Weaver	Carlsbad Nearshore Sidescan Sonar

cc=cloud cover; BS=Beaufort scale; F = Fahrenheit, (M)) Meters

Table 2. Summary of Marine Mammal Sightings, Activity, Disturbance, Required Action and Remedial or Protective Actions Taken.

Date/ Time	Vessel/ Speed/ Status	Species	Estimated Number	Activity	Disturbance Observed	Action Required	Remedial/ Protective Actions Taken
11-07-16 11:30	Ocean King 4 Knots Sidescan	California sea lion (<i>Zalophus californianus</i>)	1	Resting on surface of the water	Dove under wave as vessel approached	Monitored location and behavior	None
11-07-16 11:53	Ocean King 4 Knots Sidescan	California sea lion (<i>Zalophus californianus</i>)	2	Loafing	None	Monitored location and behavior	None
11-07-16 14:21	Ocean King 4 Knots Sidescan	Bottlenose dolphin (<i>Tursiops truncatus</i>)	2	Traveling north; within study area	Animals approached vessel then changed directions	Monitored location and behavior	None
11-08-16 08:05	Ocean King 4 Knots Sidescan	Unidentified dolphin	2	Traveling east; within study area	None	Monitored location and behavior	None

The interferometric sidescan sonar used for the survey operates at frequencies $\geq 200\text{kHz}$. As such, a safety zone monitoring and enforcement is not required for marine mammals within the survey area; however, all marine mammal encounters and responses to the vessel and survey equipment were monitored and summarized below.

Marine mammal observations at the Carlsbad study site on November 7, 2016 included 2 California Sea Lion (*Zalophus californianus*) encounters, and a bottlenose dolphin (*Tursiops truncatus*) encounter. All three marine mammal encounters were seen while the Ocean King was actively sidescanning. The first sea lion was seen resting on the surface of the ocean. The animal was at 10° starboard and 20m from the vessel in the surf zone. As the vessel approached, the animal dove under a wave and wasn't seen again. Next, two California Sea Lions were seen at 0° and 40m from the survey vessel. The animals were floating on the surface of the ocean and didn't appear to be disturbed as the Ocean King passed by. Finally, two bottlenose dolphins were sighted traveling north at 25° starboard and 30m from the vessel. The animals approached the vessel as it neared them, but changed their direction of travel to northeast when they were approximately 10m from the boat. No action was taken at this time and the animals were not seen again in the survey area.

There was only one marine mammal observation at the Carlsbad study site on November 8, 2016. This encounter consisted of two unidentified dolphins. The animals were seen in the study area traveling east at 0° and 100m from the survey vessel. The animals were directly in the glare and therefore could not be identified to species. The Ocean King was actively surveying at the time, yet there was no reaction from the animals to the survey vessel.

There were no marine mammal encounters at the Carlsbad study site on November 9, 2016.

ATTACHMENT A. FIELD DATA FORMS

Marine Wildlife Observations Form

Date: 11/7/16

Monitor: CHW

Time: <u>1130</u>	Latitude: <u>33.14804</u>	Longitude: <u>117.39832</u>
Weather: <u>partly cloudy</u>	Cloud Cover: <u>40%</u>	Glare: <u>10%</u>
Visibility: <u>500m</u>	Wind Speed: <u>10-15kts NW</u>	Sea State: <u>2</u>
Swell Height: <u>2.5m</u>	Survey Vessel Activity: <u>surveying</u>	

Marine Wildlife Observations and Interactions:

California sea lion seen resting on the surface of the water in the surf zone. Animal was seen 10°R at 20m away. No reaction to the vessel. The animal was on the surface as the vessel approached and then swam under a wave after that. Vessel was actively surveying at the time, animal was in the surf zone

Time: <u>1153</u>	Latitude: <u>33.14886</u>	Longitude: <u>117.35010</u>
Weather: <u>partly cloudy</u>	Cloud Cover: <u>40%</u>	Glare: <u>15%</u>
Visibility: <u>500m</u>	Wind Speed: <u>10-15 kts NW</u>	Sea State: <u>2</u>
Swell Height: <u>2.5m</u>	Survey Vessel Activity: <u>surveying</u>	

Marine Wildlife Observations and Interactions:

Two California sea lions seen at 0° and 40m ahead of the survey vessel. The animals were resting on the surface with their heads out of the ocean. As the vessel approached we veered right as to avoid the animals. The sea lions didn't appear to be disturbed by the passing vessel. The boat was surveying at the time

Marine Wildlife Observations Form

Date: 11/7/16

Monitor: CHW

Time: <u>1421</u>	Latitude: <u>33.15568</u>	Longitude: <u>117.35721</u>
Weather: <u>Sunny</u>	Cloud Cover: <u>30%</u>	Glare: <u>20%</u>
Visibility: <u>5000m</u>	Wind Speed: <u>15 kts</u>	Sea State: <u>3</u>
Swell Height: <u>2.5m</u>	Survey Vessel Activity: <u>surveying</u>	

Marine Wildlife Observations and Interactions:

Two bottlenose dolphins traveling N, were seen 25°R at 30m from the survey vessel. The animals approached the vessel and then changed direction to head NE. The vessel was actively surveying at the time.

Time:	Latitude:	Longitude:
Weather:	Cloud Cover:	Glare:
Visibility:	Wind Speed:	Sea State:
Swell Height:	Survey Vessel Activity:	

Marine Wildlife Observations and Interactions:

Marine Wildlife Observations Form

Date: 11/18

Monitor: CHW

Time: <u>805</u>	Latitude: <u>33.12823</u>	Longitude: <u>117.34025</u>
Weather: <u>Sunny</u>	Cloud Cover: <u>10%</u>	Glare: <u>60%</u>
Visibility: <u>5000m</u>	Wind Speed: <u>5-7kts</u>	Sea State: <u>1</u>
Swell Height: <u>1.5m</u>	Survey Vessel Activity: <u>Surveying</u>	

Marine Wildlife Observations and Interactions:

Unid dolphins seen traveling east at 0° and 100m from survey vessel. Only 2 animals seen directly in front of the boat and right in the glare. Most likely coastal bottlenose dolphins. Vessel is actively side scanning. Animals had no reaction to the boat. They were only seen very briefly.

Time:	Latitude:	Longitude:
Weather:	Cloud Cover:	Glare:
Visibility:	Wind Speed:	Sea State:
Swell Height:	Survey Vessel Activity:	

Marine Wildlife Observations and Interactions:

Page 1 of 1

APPENDIX B. PRC 9376 EXHIBIT H (MITIGATION AND MONITORING PROGRAM)

EXHIBIT H

Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
Air Quality and Greenhouse Gas (GHG) Emissions (MND Section 3.3.3)						
MM AIR-1: Engine Tuning, Engine Certification, and Fuels. The following measures will be required to be implemented by all Permittees under the Offshore Geophysical Permit Program (OGPP), as applicable depending on the county offshore which a survey is being conducted. Pursuant to section 93118.5 of CARB's Airborne Toxic Control Measures, the Tier 2 engine requirement applies only to diesel-fueled vessels.	<u>All Counties:</u> Maintain all construction equipment in proper tune according to manufacturers' specifications; fuel all off-road and portable diesel-powered equipment with California Air Resources Board (CARB)-certified motor vehicle diesel fuel limiting sulfur content to 15 parts per million or less (CARB Diesel).	Daily emissions of criteria pollutants during survey activities are minimized.	Determine engine certification of vessel engines.	OGPP permit holder and contract vessel operator; California State Lands Commission (CSLC) review of Final Monitoring Report.	Prior to, during, and after survey activities. Submit Final Monitoring Report after completion of survey activities.	Not Applicable Exempt Gas-powered Engine
	<u>Los Angeles and Orange Counties:</u> Use vessel engines meeting CARB's Tier 2-certified engines or cleaner; the survey shall be operated such that daily NO _x emissions do not exceed 100 pounds based on engine certification emission factors. This can be accomplished with Tier 2 engines if daily fuel use is 585 gallons or less, and with Tier 3 engines if daily fuel use is 935 gallons or less.		Verify that Tier 2 or cleaner engines are being used. Calculate daily NO _x emissions to verify compliance with limitations.			Not Applicable Exempt Gas-powered Engine
	<u>San Luis Obispo County:</u> Use vessel engines meeting CARB's Tier 2-certified engines or cleaner, accomplished with Tier 2 engines if daily fuel use is 585 gallons or less; all diesel equipment shall not idle for more than 5 minutes; engine use needed to maintain position in the water is not considered idling; diesel idling within 300 meters (1,000 feet) of sensitive receptors is not permitted; use alternatively fueled construction equipment on site where feasible, such as compressed natural gas, liquefied natural gas, propane or biodiesel.		Verify that Tier 2 or cleaner engines are being used. Inform vessel operator(s) of idling limitation. Investigate availability of alternative fuels.			Not Applicable Exempt Gas-powered Engine
	<u>Santa Barbara County:</u> Use vessel engines meeting CARB's Tier 2-certified engines or cleaner, accomplished with Tier 2 engines if daily fuel use is 790 gallons or less.		Verify that Tier 2 or cleaner engines are being used. Investigate availability of alternative fuels.			Not Applicable Exempt Gas-powered Engine
	<u>Ventura County:</u> Use alternatively fueled construction equipment on site where feasible, such as compressed natural gas, liquefied natural gas, propane or biodiesel.		Investigate availability of alternative fuels.			

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Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
MM BIO-1: Marine Mammal and Sea Turtle Presence – Current Information.	All State waters; prior to commencement of survey operations, the geophysical operator shall: (1) contact the National Oceanic and Atmospheric Administration Long Beach office staff and local whale-watching operations and shall acquire information on the current composition and relative abundance of marine wildlife offshore, and (2) convey sightings data to the vessel operator and crew, survey party chief, and onboard Marine Wildlife Monitors (MWMs) prior to departure. This information will aid the MWMs by providing data on the approximate number and types of organisms that may be in the area.	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	Document contact with appropriate sources. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder; Inquiry to NOAA and local whale watching operators.	Prior to survey.	10-17-16 KWM
MM BIO-2: Marine Wildlife Monitors (MWMs).	Except as provided in section 7(h) of the General Permit, a minimum of two (2) qualified MWMs who are experienced in marine wildlife observations shall be onboard the survey vessel throughout both transit and data collection activities. The specific monitoring, observation, and data collection responsibilities shall be identified in the Marine Wildlife Contingency Plan required as part of all Offshore Geophysical Permit Program permits. Qualifications of proposed MWMs shall be submitted to the National Oceanic and Atmospheric Administration (NOAA) and CSLC at least twenty-one (21) days in advance of the survey for their approval by the agencies. Survey operations shall not commence until the CSLC approves the MWMs.	Competent and professional monitoring or marine mammals and sea turtles; compliance with established monitoring policies.	Document contact with and approval by appropriate agencies. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Prior to survey.	10-17-16 KWM
MM BIO-3: Safety Zone Monitoring.	Onboard Marine Wildlife Monitors (MWMs) responsible for observations during vessel transit shall be responsible for monitoring during the survey equipment operations. All visual monitoring shall occur from the highest practical vantage point aboard the survey vessel; binoculars shall be used to observe the surrounding area, as appropriate. The MWMs will survey an area (i.e., safety or exclusion zone) based on the equipment used, centered on the sound source (i.e., vessel, towfish), throughout time that the survey equipment is operating. Safety zone radial distances, by equipment type, include:	No adverse effects to marine mammals or sea turtles due to survey activities are observed; compliance with established safety zones.	Compliance with permit requirements (observers); compliance with established safety zones. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Prior to survey.	10-17-16 KWM

EXHIBIT H

Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials												
	<table><tr><th>Equipment Type</th><th>Safety Zone (radius, m)</th></tr><tr><td>Single Beam Echosounder</td><td>50</td></tr><tr><td>Multibeam Echosounder</td><td>500</td></tr><tr><td>Side-Scan Sonar</td><td>600</td></tr><tr><td>Subbottom Profiler</td><td>100</td></tr><tr><td>Boomer System</td><td>100</td></tr></table> <p>If the geophysical survey equipment is operated at or above a frequency of 200 kilohertz (kHz), safety zone monitoring and enforcement is not required; however, if geophysical survey equipment operated at a frequency at or above 200 kHz is used simultaneously with geophysical survey equipment less than 200 kHz, then the safety zone for the equipment less than 200 kHz must be monitored. The onboard MWMs shall have authority to stop operations if a mammal or turtle is observed within the specified safety zone and may be negatively affected by survey activities. The MWMs shall also have authority to recommend continuation (or cessation) of operations during periods of limited visibility (i.e., fog, rain) based on the observed abundance of marine wildlife. Periodic reevaluation of weather conditions and reassessment of the continuation/cessation recommendation shall be completed by the onboard MWMs. During operations, if an animal's actions are observed to be irregular, the monitor shall have authority to recommend that equipment be shut down until the animal moves further away from the sound source. If irregular behavior is observed, the equipment shall be shut-off and will be restarted and ramped-up to full power, as applicable, or will not be started until the animal(s) is/are outside of the safety zone or have not been observed for 15 minutes.</p> <p>For nearshore survey operations utilizing vessels that lack the personnel capacity to hold two (2) MWMs aboard during survey operations, at least twenty-one (21) days prior to the commencement of survey activities, the Permittee may petition the CSLC to conduct survey operations with one (1) MWM aboard. The CSLC will consider such authorization on a case-by-case basis and</p>	Equipment Type	Safety Zone (radius, m)	Single Beam Echosounder	50	Multibeam Echosounder	500	Side-Scan Sonar	600	Subbottom Profiler	100	Boomer System	100					10-17-16 KWM
Equipment Type	Safety Zone (radius, m)																	
Single Beam Echosounder	50																	
Multibeam Echosounder	500																	
Side-Scan Sonar	600																	
Subbottom Profiler	100																	
Boomer System	100																	

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Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
	factors the CSLC will consider will include the timing, type, and location of the survey, the size of the vessel, and the availability of alternate vessels for conducting the proposed survey. CSLC authorizations under this subsection will be limited to individual surveys and under any such authorization; the Permittee shall update the MWCP to reflect how survey operations will occur under the authorization.					
MM BIO-4: Limits on Nighttime OGPP Surveys.	All State waters; nighttime survey operations are prohibited under the OGPP, except as provided below. The CSLC will consider the use of single beam echosounders and passive equipment types at night on a case-by-case basis, taking into consideration the equipment specifications, location, timing, and duration of survey activity.	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	Presurvey request for nighttime operations, including equipment specifications and proposed use schedule. Document equipment use. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Approval required before survey is initiated. Monitoring Report following completion of survey.	Not Applicable No nighttime surveys
MM BIO-5: Soft Start.	All State waters; the survey operator shall use a "soft start" technique at the beginning of survey activities each day (or following a shut down) to allow any marine mammal that may be in the immediate area to leave before the sound sources reach full energy. Surveys shall not commence at nighttime or when the safety zone cannot be effectively monitored. Operators shall initiate each piece of equipment at the lowest practical sound level, increasing output in such a manner as to increase in steps not exceeding approximately 6 decibels (dB) per 5-minute period. During ramp-up, the Marine Wildlife Monitors (MWMs) shall monitor the safety zone. If marine mammals are sighted within or about to enter the safety zone, a power-down or shut down shall be implemented as though the equipment was operating at full power. Initiation of ramp-up procedures from shut down requires that the MWMs be able to visually observe the full safety zone.	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	Compliance with permit requirements (observers); compliance with safe start procedures. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Immediately prior to survey.	11-7-16 11-8-16 11-9-16 KWM/JDV

EXHIBIT H

Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
MM BIO-6: Practical Limitations on Equipment Use and Adherence to Equipment Manufacturer's Routine Maintenance Schedule.	<p>All State waters; geophysical operators shall follow, to the maximum extent possible, the guidelines of Zykov (2013) as they pertain to the use of subbottom profilers and side-scan sonar, including:</p> <ul style="list-style-type: none"> Using the highest frequency band possible for the subbottom profiler; Using the shortest possible pulse length; and Lowering the pulse rate (pings per second) as much as feasible. <p>Geophysical operators shall consider the potential applicability of these measures to other equipment types (e.g., boomer). Permit holders will conduct routine inspection and maintenance of acoustic-generating equipment to ensure that low energy geophysical equipment used during permitted survey activities remains in proper working order and within manufacturer's equipment specifications. Verification of the date and occurrence of such equipment inspection and maintenance shall be provided in the required presurvey notification to CSLC.</p>	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	<p>Document initial and during survey equipment settings.</p> <p>Submit Final Monitoring Report after completion of survey activities.</p>	OGPP permit holder.	Immediately prior to and during survey.	<p>11-7-16 11-8-16 11-9-16</p> <p>KWM/JDV</p>
MM BIO-7: Avoidance of Pinniped Haul-Out Sites.	<p>The Marine Wildlife Contingency Plan (MWCP) developed and implemented for each survey shall include identification of haul-out sites within or immediately adjacent to the proposed survey area. For surveys within 300 meters (m) of a haul-out site, the MWCP shall further require that:</p> <ul style="list-style-type: none"> The survey vessel shall not approach within 91 m of a haul-out site, consistent with National Marine Fisheries Service (NMFS) guidelines; Survey activity close to haul-out sites shall be conducted in an expedited manner to minimize the potential for disturbance of pinnipeds on land; and Marine Wildlife Monitors shall monitor pinniped activity onshore as the vessel approaches, observing and reporting on the number of pinnipeds potentially disturbed (e.g., via head lifting, flushing into the water). The purpose of such reporting is to provide CSLC and California Department of Fish and Wildlife (CDFW) with information regarding potential disturbance associated with OGPP surveys. 	No adverse effects to pinnipeds at haul outs are observed.	<p>Document pinniped reactions to vessel presence and equipment use.</p> <p>Submit Final Monitoring Report after completion of survey activities.</p>	OGPP permit holder.	Monitoring Report following completion of survey.	<p>11-7-16 11-8-16 11-9-16</p> <p>KWM/CHW</p>

EXHIBIT H

Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
MM BIO-8: Reporting Requirements – Collision.	<p>All State waters; if a collision with marine mammal or reptile occurs, the vessel operator shall document the conditions under which the accident occurred, including the following:</p> <ul style="list-style-type: none"> • Vessel location (latitude, longitude) when the collision occurred; • Date and time of collision; • Speed and heading of the vessel at the time of collision; • Observation conditions (e.g., wind speed and direction, swell height, visibility in miles or kilometers, and presence of rain or fog) at the time of collision; • Species of marine wildlife contacted (if known); • Whether an observer was monitoring marine wildlife at the time of collision; and, • Name of vessel, vessel owner/operator, and captain officer in charge of the vessel at time of collision. <p>After a collision, the vessel shall stop, if safe to do so; however, the vessel is not obligated to stand by and may proceed after confirming that it will not further damage the animal by doing so. The vessel will then immediately communicate by radio or telephone all details to the vessel's base of operations, and shall immediately report the incident. Consistent with Marine Mammal Protection Act requirements, the vessel's base of operations or, if an onboard telephone is available, the vessel captain him/herself, will then immediately call the National Oceanic and Atmospheric Administration (NOAA) Stranding Coordinator to report the collision and follow any subsequent instructions. From the report, the Stranding Coordinator will coordinate subsequent action, including enlisting the aid of marine mammal rescue organizations, if appropriate. From the vessel's base of operations, a telephone call will be placed to the Stranding Coordinator, NOAA National Marine Fisheries Service (NMFS), Southwest Region, Long Beach, to obtain instructions. Although NOAA has primary responsibility for marine mammals in both State and Federal waters, the California Department of Fish and Wildlife (CDFW) will also be advised that an incident has occurred in State waters affecting a protected species.</p>	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Monitoring Report following completion of survey.	<p>Not Applicable No collisions occurred</p> <p>11-9-16 KWM/CHW</p>

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MM BIO-9: Limitations on Survey Operations in Select Marine Protected Areas (MPAs).	All MPAs; prior to commencing survey activities, geophysical operators shall coordinate with the CSLC, California Department of Fish and Wildlife (CDFW), and any other appropriate permitting agency regarding proposed operations within MPAs. The scope and purpose of each survey proposed within a MPA shall be defined by the permit holder, and the applicability of the survey to the allowable MPA activities shall be delineated by the permit holder. If deemed necessary by CDFW, geophysical operators will pursue a scientific collecting permit, or other appropriate authorization, to secure approval to work within a MPA, and shall provide a copy of such authorization to the CSLC as part of the required presurvey notification to CSLC. CSLC, CDFW, and/or other permitting agencies may impose further restrictions on survey activities as conditions of approval.	No adverse effects to MPA resources due to survey activities are observed.	Monitor reactions of wildlife to survey operations; report on shutdown conditions and survey restart. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder; survey permitted by CDFW.	Prior to survey.	Not applicable No work in an MPA 10-17-16 KWM
MM HAZ-1: Oil Spill Contingency Plan (OSCP) Required Information.	Permittees shall develop and submit to CSLC staff for review and approval an OSCP that addresses accidental releases of petroleum and/or non-petroleum products during survey operations. Permittees' OSCPs shall include the following information for each vessel to be involved with the survey: <ul style="list-style-type: none"> • Specific steps to be taken in the event of a spill, including notification names, phone numbers, and locations of: (1) nearby emergency medical facilities, and (2) wildlife rescue/response organizations (e.g., Oiled Wildlife Care Network); • Description of crew training and equipment testing procedures; and • Description, quantities, and location of spill response equipment onboard the vessel. 	Reduction in the potential for an accidental spill. Proper and timely response and notification of responsible parties in the event of a spill.	Documentation of proper spill training. Notification of responsible parties in the event of a spill.	OGPP permit holder and contract vessel operator.	Prior to survey.	10-17-16 KWM/JDV
MM HAZ-2: Vessel fueling restrictions.	Vessel fueling shall only occur at an approved docking facility. No cross vessel fueling shall be allowed.	Reduction in the potential for an accidental spill.	Documentation of fueling activities.	Contract vessel operator.	Following survey.	Not applicable Vessel trailered JDV
MM HAZ-3: OSCP equipment and supplies.	Onboard spill response equipment and supplies shall be sufficient to contain and recover the worst-case scenario spill of petroleum products as outlined in the OSCP.	Proper and timely response in the event of a spill.	Notification to CSLC of onboard spill response equipment/supplies inventory, verify	Contract vessel operator.	Prior to survey.	10-17-16 KWM/JDV

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Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
			ability to respond to worst-case spill.			
MM HAZ-1: Oil Spill Contingency Plan (OSCP) Required Information.	Outlined under Hazards and Hazardous Materials (above)					10-17-16 KWM
MM HAZ-2: Vessel fueling restrictions.	Outlined under Hazards and Hazardous Materials (above)					Boat trailered and fueled on land
MM HAZ-3: OSCP equipment and supplies.	Outlined under Hazards and Hazardous Materials (above)					10-17-16 KWM
MM BIO-9: Limitations on Survey Operations in Select MPAs.	Outlined under Biological Resources (above)					No work in MPA
MM REC-1: U.S. Coast Guard (USCG), Harbormaster, and Dive Shop Operator Notification.	All California waters where recreational diving may occur; as a survey permit condition, the CSLC shall require Permittees to provide the USCG with survey details, including information on vessel types, survey locations, times, contact information, and other details of activities that may pose a hazard to divers so that USCG can include the information in the Local Notice to Mariners, advising vessels to avoid potential hazards near survey areas. Furthermore, at least twenty-one (21) days in advance of in-water activities, Permittees shall: (1) post such notices in the harbormasters' offices of regional harbors; and (2) notify operators of dive shops in coastal locations adjacent to the proposed offshore survey operations.	No adverse effects to recreational divers from survey operations.	Notify the USCG, local harbormasters, and local dive shops of planned survey activity. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Prior to survey.	10-17-16 KWM

EXHIBIT H

Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
MM FISH-1: U.S. Coast Guard (USCG) and Harbormaster Notification.	All California waters; as a survey permit condition, the CSLC shall require Permittees to provide the USCG with survey details, including information on vessel types, survey locations, times, contact information, and other details of activities that may pose a hazard to mariners and fishers so that USCG can include the information in the Local Notice to Mariners, advising vessels to avoid potential hazards near survey areas. Furthermore, at least twenty-one (21) days in advance of in-water activities, Permittees shall post such notices in the harbormasters' offices of regional harbors.	No adverse effects to commercial fishing gear in place.	Notify the USCG and local harbormasters of planned survey activity. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Prior to survey.	10-17-16 KWM
MM FISH-2: Minimize Interaction with Fishing Gear.	To minimize interaction with fishing gear that may be present within a survey area: (1) the geophysical vessel (or designated vessel) shall traverse the proposed survey corridor prior to commencing survey operations to note and record the presence, type, and location of deployed fishing gear (i.e., buoys); (2) no survey lines within 30 m (100 feet) of observed fishing gear shall be conducted. The survey crew shall not remove or relocate any fishing gear; removal or relocation shall only be accomplished by the owner of the gear upon notification by the survey operator of the potential conflict.	No adverse effects to commercial fishing gear in place.	Visually observe the survey area for commercial fishing gear. Notify the gear owner and request relocation of gear outside survey area. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Immediately prior to survey (prior to each survey day).	11-7-16 11-8-16 11-9-16 KWM/JDV
MM FISH-1: USCG and Harbormaster Notification.	Outlined under Commercial and Recreational Fisheries (above)					10-17-16 KWM

Acronyms/Abbreviations: CARB = California Air Resources Board; CDFW = California Department of Fish and Wildlife; CSLC = California State Lands Commission; dB = decibels; kHz = kilohertz; MPA = Marine Protected Area; MWCP = Marine Wildlife Contingency Plan; MWM = Marine Wildlife Monitor; m= meter(s); NOAA = National Oceanic and Atmospheric Administration; NO_x = Nitrogen Oxide; OGPP = Offshore Geophysical Permit Program; OSCP = Oil Spill Contingency Plan; USCG = U.S. Coast Guard